DETAILED ACTION

Status of Claims

1. Newly added Claims 43-59 are pending in this application.

Claims 1-42 have been canceled.

Response to Arguments

2. Applicant's arguments with respect to claims 43-59 have been considered but are moot in view of the new ground(s) of rejection.

Regarding Applicant's Argument:

"Hu is not directed to a print data system and does not disclose use with print data and a print data server".

Examiner's Response:

Hu discloses a networked system, and methods of increasing the network and storage access performance and throughput; however

Hu does not disclose expressly a print data system in conjunction with a print data server.

Ueda discloses a print data system with a print data server (Server 106, Printer 104, and Network 105 of Figure 1).

Ueda & Hu are combinable because they are from the same field of endeavor of image processing; e.g., both references disclose methods of reducing the load on a server and a network. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to further disclose the use of a print server within Hu's data network. The suggestion/motivation for doing so would have been to take into account that some data traffic may be intended to be printed and to include a networked print server that can accept print jobs from another server or devices within the network and to send the jobs to the appropriate printers. This would ensure that there is always a printer available to process a print job. If one printer is temporarily out of service for some reason, then the print job can be routed to an available printer. Therefore, it would have been obvious to combine Hu's system for achieving higher throughput in a data network with Ueda's networked print server to obtain the invention as specified in order to save time and money.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 43-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu et al. (US 6,535,518) hereafter 'Hu', in view of Ueda et al. (US 2002/0063891) hereafter 'Ueda'.

Regarding Claims 1-42: (cancelled)

Regarding Claim 43: (new)

Ueda discloses a method to transfer print data in a server system having a first print data server, comprising the steps of:

providing the first print data server with a supplying computer module as a computer-readable medium having a computer program and which supplies print data (FIG. 3 describes the software structure for the preferred embodiment for the data-driven multi-processor pipelined model. The functional relationship among the software modules is described at Column 11, line 34);

providing a reading computer module as a computer readable medium having a computer program that reads the supplied print data (In one of Hu's methods e.g., Once a file read request is sent to the host, the TWIP file system does not have to wait for response. It can proceed to process the next connection. After the host acknowledges the request (registration), the TWIP file system will go back to read the file as described in Column 17, lines 13-17);

selecting one of the following transmission modes

a complete storage of the print data in a file occurs before the reading computer module reads the print data (e.g., Authorized *non-real-time data transfer* between a network interface and a storage interface described in Column 5, lines 44-45.),

a segment-by-segment storage of the data in a file occurs such that the reading computer module already begins with the reading of a segment while the supplying computer module is still supplying print data (e.g., The data content then is divided into segments of integral multiples of a fixed base, a process that we call "base-multiple segmentation" (BMS) technology. For example, a base of y bytes, say 2 Kbytes, is chosen, and all data streams or files are *segmented into chunks* of integral multiples of 2 Kbytes, like 2, 4, or 8 Kbytes (padding it for the last chunk if it is not an exact integral multiple of 2 Kbytes), with an upper limit of, say, 40 Kbytes (20 times y). The maximum size is chosen based-on the requirement of isochronous real-time traffic and the switching speed, such that it will still meet the tightest real-time needs while the switching element serves the largest segments as described in Column 6, lines 3-12), and

a direct transmission of the print data between the supplying computer module and the reading computer module occurs without buffering (e.g., Authorized *real-time data transfer* between a network interface and a storage interface as described in Column 5, lines 42-43.);

controlling the selecting of the transmission mode by at least one control parameter predetermined in a print job manager, the reading computer module and the supplying computer module cooperating via the at least one control parameter(e.g., Once the nature of the traffic is determined, by consulting the Expanded Routing Table (ERT) (with more information than a regular routing table), as shown in FIG. 14, a proper switching path can be selected to forward the traffic with proper QoS measurement. For instance, higher priority traffic can be given more bandwidth and/or lower delay. The forwarded traffic to the network will then be processed with the proper protocol format conversion for transmission with all the necessary error checking and/or correction as described in Column 6, lines 19-27.); and

also controlling the selecting of the transmission mode dependent on the print job (e.g., Once the nature of the traffic is determined, by consulting the Expanded Routing Table (ERT) (with more information than a regular routing table), as shown in FIG. 14, a proper switching path can be selected to forward the traffic with proper QoS measurement. For instance, higher priority traffic can be given more bandwidth and/or lower delay. The forwarded traffic to the network will then be processed with the proper protocol format conversion for transmission with all the necessary error checking and/or correction as described in Column 6, lines 19-27.).

Hu discloses a networked system, and methods of increasing the network and storage access performance and throughput; however

Hu does not disclose expressly a print data system in conjunction with a print data server.

Ueda discloses a print data system with a print data server (Server 106, Printer 104, and Network 105 of Figure 1).

Ueda & Hu are combinable because they are from the same field of endeavor of image processing; e.g., both references disclose methods of reducing the load on a server and a network. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to further disclose the use of a print server within Hu's data network. The suggestion/motivation for doing so would have been to take into account that some data traffic may be intended to be printed and to include a networked print server that can accept print jobs from another server or devices within the network and to send the jobs to the appropriate printers. This would ensure that there is always a printer available to process a print job. If one printer is temporarily out of service for some reason, then the print job can be routed to an available printer. Therefore, it would have been obvious to combine Hu's system for achieving higher throughput in a data network with Ueda's networked print server to obtain the invention as specified in order to save time and money.

Regarding Claim 52: (new)

Claim 52 recites the same limitations as method Claim 43, except that Claim 52 is a system of Claim 43, thus the rejection as applied to Claim 43 is equally applicable to Claim 52.

Regarding Claim 44. (new)

Hu further discloses the method according to claim 43 wherein in the transmission mode with the direct transmission of the data, the reading computer module reacts, controlled by at least one parameter, in one of the following manners when data to be read no longer exists:

the read event is continuously repeated until data to be read is present, or until the reading computer module receives the notification that data is no longer being supplied, or the read event is aborted (e.g., In the second method, the host write request is intercepted by the TWIP host device driver. The TWIP host device driver then generates a write request (w_req). Then TWIP completes all outstanding read requests and sends back a write acknowledgement (w_ack) to the host and routes all future read requests to the host. Upon receiving the signal w_ack at the host, the TWIP host device driver releases the hold on the original write requests and proceeds to write (thick vertical line on host in FIG. 5). Once the host finishes all outstanding write operations, the TWIP device driver detects this and sends write-release (w_rel) to TWIP. When TWIP receives w_rel, it resumes the bypass function if it can handle the new incoming requests as described in Column 17, lines 17-28).

Regarding Claim 53: (new)

Claim 53 recites the same limitations as method Claim 44, except that Claim 53 is a system of Claim 44, thus the rejection as applied to Claim 44 is equally applicable to Claim 53.

Regarding Claim 45: (new)

Hu further discloses the method according to claim 43 wherein the data are supplied in blocks in a block format determined by the supplying computer module (FIG. 6 depicts the relationship among the buffer cache, the TWIP file system, and the TWIP file system device driver. The buffer cache allocates buffer pages for blocks of data on the disk. Each page corresponds to a block on the disk as described in Column 18, lines 16-20.)

Regarding Claim 54: (new)

Claim 54 recites the same limitations as method Claim 45, except that Claim 54 is a system of Claim 45, thus the rejection as applied to Claim 45 is equally applicable to Claim 54.

Regarding Claim 46: (new)

Hu further discloses the method according to claim 43 wherein the data transmission of the data occurs via a socket connection established between the supplying computer module and the reading computer module (Referring to Figure 4: TCB Tx Queue (812)/Rx Queue (811)--This is the socket queue for transmitting (812) and receiving (811).

Regarding Claim 55: (new)

Claim 55 recites the same limitations as method Claim 46, except that Claim 55 is a system of Claim 46, thus the rejection as applied to Claim 46 is equally applicable to Claim 55.

Regarding Claim 47: (new)

Hu further discloses the method according to claim 43 wherein given the storage in segments of print data, print data of a print job are already further processed via the reading computer module in a subsequent process, while subsequent print data of the same print job are still being stored (FIGS. 11 and 12 are flow charts for data flow from network to storage or vice-versa.)

Regarding Claim 56: (new)

Claim 56 recites the same limitations as method Claim 47, except that Claim 54 is a system of Claim 47, thus the rejection as applied to Claim 47 is equally applicable to Claim 56.

Regarding Claim 48: (new)

Hu further discloses the method according to claim 43 wherein the transmission mode to be applied is established dependent on the print job in a print job corollary file (e.g., Once the nature of the traffic is determined, by consulting the Expanded Routing Table (ERT) (with more information than a regular routing table), as shown in FIG. 14, a proper switching path can be selected to forward the traffic with proper QoS measurement. For instance, higher priority traffic can be given more bandwidth and/or lower delay. The forwarded traffic to the network will then be processed with the proper protocol format conversion for transmission with all the necessary error checking and/or correction as described in Column 6, lines 19-27.)

Regarding Claim 57: (new)

Claim 57 recites the same limitations as method Claim 48, except that Claim 54 is a system of Claim 48, thus the rejection as applied to Claim 48 is equally applicable to Claim 57.

Regarding Claim 49: (new)

A method according to claim 43 wherein the reading computer module runs on a second print data server (In this description, there are three types of logical medium interfaces: the network, storage and server(s). In actual implementation, various physical interfaces are possible, e.g., multiple network interfaces or storage interfaces or multiple servers ; There may also be a speed matching function between the network and storage, load balancing functions for servers as described in Column 8, lines 9-20.).

Regarding Claim 58: (new)

Claim 58 recites the same limitations as method Claim 49, except that Claim 58 is a system of Claim 49, thus the rejection as applied to Claim 49 is equally applicable to Claim 58.

Regarding Claim 50: (new)

A method according to claim 43 wherein both the supplying computer module and the reading computer module run on the first server (In this description, there are three types of logical medium interfaces: the network, storage and server(s). In actual implementation, various physical interfaces are possible, e.g., multiple network interfaces or storage interfaces or multiple servers ; There may also be a speed matching function between the network and storage, load balancing functions for servers as described in Column 8, lines 9-20.).

Regarding Claim 59: (new)

Claim 59 recites the same limitations as method Claim 50, except that Claim 59 is a system of Claim 50, thus the rejection as applied to Claim 50 is equally applicable to Claim 59.

Regarding Claim 51: (new)

A method to transfer data in a print data service system comprising at least first and second print data servers, comprising the steps of:

providing the first print data server with a supplying computer module as a computer readable medium having a computer program supplying print data (FIG. 3 describes the software structure for the preferred embodiment for the data-driven multi-processor pipelined model. The functional relationship among the software modules is described at Column 11, line 34);

providing the second print data server with a reading computer module as a computer-readable medium having a computer program that reads the supplied print data **(FIG. 3 describes the software structure for the preferred embodiment for the data-driven multi-processor pipelined model. The functional relationship among the software modules is described at Column 11, line 34);** (In this description, there are three types of logical medium interfaces: the network, storage and server(s). In actual implementation, various physical interfaces are possible, e.g., multiple network interfaces or storage interfaces or multiple servers ; There may also be a speed matching function between the network and storage, load balancing functions for servers as described in Column 8, lines 9-20.);

selecting one of the following transmission modes

a complete storage of the print data in a file occurs before the reading computer module reads the print data (e.g., Authorized *non-real-time data transfer* between a network interface and a storage interface described in Column 5, lines 44-45.),

a segment-by-segment storage of the data in a file occurs such that the reading computer module already begins with the reading of a segment while the supplying computer module is still supplying print data (e.g., The data content then is divided into segments of integral multiples of a fixed base, a process that we call "base-multiple segmentation" (BMS) technology. For example, a base of y bytes, say 2 Kbytes, is chosen, and all data streams or files are *segmented into chunks* of integral multiples of 2 Kbytes, like 2, 4, or 8 Kbytes (padding it for the last chunk if it is not an exact integral multiple of 2 Kbytes), with an upper limit of, say, 40 Kbytes (20 times y). The maximum size is chosen based-on the requirement of isochronous real-time traffic and the switching speed, such that it will still meet the tightest real-time needs while the switching element serves the largest segments as described in Column 6, lines 3-12), and

a direct transmission of the print data between the supplying computer module and the reading computer module occurs without buffering; controlling the selecting of the transmission mode by at least one control parameter predetermined in a print job manager, the reading computer module and the supplying computer module cooperating via the at least one control parameter (e.g., Authorized *real-time data transfer* between a network interface and a storage interface as described in Column 5, lines 42-43.);

also controlling the selecting of the transmission mode dependent on the print job (e.g., Once the nature of the traffic is determined, by consulting the Expanded Routing Table (ERT) (with more information than a regular routing table), as shown in FIG. 14, a proper switching path can be selected to forward the traffic with proper QoS measurement. For instance, higher priority traffic can be given more bandwidth and/or lower delay. The forwarded traffic to the network will then be processed with the proper protocol format conversion for transmission with all the necessary error checking and/or correction as described in Column 6, lines 19-27.);

the data being supplied in blocks in a block format predetermined by the supplying computer module(FIG. 6 depicts the relationship among the buffer cache, the TWIP file system, and the TWIP file system device driver. The buffer cache allocates buffer pages for blocks of data on the disk. Each page corresponds to a block on the disk as described in Column 18, lines 16-20.); and

given the storage in segments of print data, print data of a print job are already further processed via the reading computer module in a subsequent process, while subsequent print data of the same print job are still being stored (FIGS. 11 and 12 are flow charts for data flow from network to storage or vice-versa.).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cadden et al. (US 6,418,519) discloses a write-behind computer program product is presented which allows writing data to multiple volumes of storage media associated with one or more server nodes in a distributed processing environment.

Examiner Notes

6. The Examiner cites particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully considers the references in its entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or as disclosed by the Examiner.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neil R. McLean whose telephone number is (571)270-1679. The examiner can normally be reached on Monday through Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571.272.7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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